

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claims 1 –21 (cancelled)

Claim 22 (currently amended): The method of claim [[15]] 25, wherein said mixture consists essentially of:

- a) a helium volume proportion of about 30% to about 80%; and
- b) a nitrogen volume proportion of about 20% to about 70%.

Claims 23-24 (cancelled)

Claim 25 (previously presented): A method for laser beam welding with a shielding gas mixture, said mixture comprising helium and nitrogen, wherein the volume proportion of said helium in said mixture comprises about 1% to about 30% for a laser beam power density of about 500 kW/cm² to about 2000 kW/cm².

Claims 26 – 27 (cancelled)

Claim 28 (previously presented): A method of laser beam welding with a shielding gas mixture comprising helium and nitrogen, wherein the volume proportion of said helium in said mixture is a function of the power density such that:

$$28 \times \ln(\Phi_p) - 207 \leq \%He \leq 32.3 \times \ln(\Phi_p) - 207$$

wherein:

- a) $\ln(\Phi_p)$ represents the natural logarithm of said power density expressed in kW/cm²; and
- b) %He represents the volume percentage of helium in nitrogen of said gas mixture.

Claim 29 (previously presented): The process of claim 28, wherein said volume proportion of said helium in said mixture is a function of said power density such that:

$$28.5 \times \ln(\Phi_P) - 207 \leq \%He \leq 31.5 \times \ln(\Phi_P) - 207.$$

Claim 30 (previously presented): The process of claim 29, wherein said volume proportion of said helium in said mixture is a function of said power density such that:

$$29 \times \ln(\Phi_P) - 207 \leq \%He \leq 31 \times \ln(\Phi_P) - 207.$$

Claims 31-32 (canceled)

Claim 33 (previously presented): A method of laser beam welding with a shielding gas mixture, said mixture comprising helium and nitrogen, wherein the volume proportion of said helium in said mixture comprises about 30% to about 50% for a laser beam power density of about 2000 kW/cm² to about 4000 kw/cm².

Claim 34 (previously presented): A method of laser beam welding with a shielding gas mixture, said mixture comprising helium and nitrogen, wherein the volume proportion of said helium in said mixture comprises about 50% to about 70% for a laser beam power density of about 4000 kW/cm² to about 10000 kw/cm².

Claim 35 (canceled)

Claim 36 (new): The method of claim 25, wherein said mixture consists essentially of:

- a) a helium volume proportion of about 30% to about 80%; and
- b) a nitrogen volume proportion of about 20% to about 70%.

Claim 37 (new): The method of claim 28, wherein said mixture consists essentially of:

- a) a helium volume proportion of about 30% to about 80%; and

- b) a nitrogen volume proportion of about 20% to about 70%.

Claim 38 (new): The method of claim 33, wherein said mixture consists essentially of:

- a) a helium volume proportion of about 30% to about 80%; and
- b) a nitrogen volume proportion of about 20% to about 70%.

Claim 39 (new): The method of claim 34, wherein said mixture consists essentially of:

- a) a helium volume proportion of about 30% to about 80%; and
- b) a nitrogen volume proportion of about 20% to about 70%.